



DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XE396

Endangered and Threatened Species; Take of Anadromous Fish

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Issuance seven new scientific research permits, and fourteen renewal scientific research permits.

SUMMARY: Notice is hereby given that NMFS has issued Permit 1440 – 2R to the Interagency Ecological Program (IEP); Permit 13675 – 2R to the Fishery Foundation of California (FFC); Permit 13791 – 2R to the United States Fish and Wildlife Service (USFWS), Stockton Fish and Wildlife Office (SFWO); Permit 14516 – 2R to Dr. Jerry Smith, Associate Professor in the Department of Biological Sciences at San Jose State University; Permit 15215 to the California Department of Fish and Wildlife (CDFW), Fisheries Branch, Fish Health Laboratory; Permit 16274 to the Mendocino Redwood Company (MRC); Permit 17063 to the United States Forest Service (USFS), Redwood Sciences Laboratory; Permit 17077 – 2R to Dr. Peter Moyle, with the University of California at Davis, Department of Wildlife, Fish and Conservation Biology; Permit 17219 and Permit 19320 to the NMFS Southwest Fisheries Science Center (SWFSC), Fisheries Ecology Division; Permit 17272 to the USFWS, Arcata Fish and Wildlife Office Fisheries Program (AFWO); Permit 17351 to the Green Diamond Resource

Company (GDRC); Permit 17396 to the USFWS, Anadromous Fish Restoration Program (AFRP); Permit 17867 to the Humboldt Redwood Company (HRC); Permit 17877 to the Bureau of Reclamation (BOR); Permit 17916 to the Bureau of Land Management (BLM), Arcata Field Office; Permit 18012 to the CDFW, Bay Delta Region; Permit 18712 to H.T. Harvey & Associates; Permit 18937 to the Scripps Institution of Oceanography, University of California, San Diego, California Sea Grant College Program (CSGCP); Permit 19121 to the United States Geological Survey (USGS), California Water Survey; and Permit 19400 to ICF consulting.

ADDRESSES: The approved application for each permit is available on the Applications and Permits for Protected Species (APPS), <https://apps.nmfs.noaa.gov> web site by searching the permit number within the Search Database page. The applications, issued permits and supporting documents are also available upon written request or by appointment: Protected Resources Division, NMFS, 777 Sonoma Avenue, Room 325, Santa Rosa, CA 95404 ph: (707) 575-6080, fax: (707) 578-3435).

FOR FURTHER INFORMATION CONTACT: Jeff Abrams, Santa Rosa, CA (ph.: 707-575-6080), Fax: 707-578-3435, e-mail: *Jeff.Abrams @noaa.gov*).

SUPPLEMENTARY INFORMATION:

The issuance of permits and permit modifications, as required by the Endangered Species Act of 1973 (16 U.S.C. 1531-1543) (ESA), is based on a finding that such permits/modifications: (1) are applied for in good faith; (2) would not operate to the disadvantage of the listed species which are the subject of the permits; and (3) are consistent with the purposes and policies set forth in section 2 of the ESA. Authority to take listed species is subject to conditions set forth in the permits. Permits and

modifications are issued in accordance with and are subject to the ESA and NMFS regulations (50 CFR parts 222-226) governing listed fish and wildlife permits.

Species Covered in This Notice

The following listed species are covered in this notice:

Chinook salmon (*Oncorhynchus tshawytscha*): threatened Snake River spring/summer-run (SR spr/sum); threatened Lower Columbia River (LCR); threatened California Coastal (CC); threatened Central Valley spring-run (CVSR); endangered Sacramento River winter-run (SRWR).

Coho salmon (*O. kisutch*): threatened Southern Oregon/Northern California Coast (SONCC); endangered Central California Coast (CCC).

Steelhead (*O. mykiss*): threatened Northern California (NC); threatened CCC; threatened California Central Valley (CCV); threatened South-Central California Coast (S-CCC); endangered Southern California (SC).

North American green sturgeon (*Acipenser medirostris*): threatened southern distinct population segment (sDPS).

Eulachon (*Thaleichthys pacificus*): threatened sDPS.

Permits Issued

Permit 1440 – 2R

A notice of receipt of an application for scientific research permit renewal (1440-2R) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 1440-2R was issued to IEP on December 23, 2015 and expires on December 31, 2020.

Permit 1440-2R authorizes IEP to take CVSR Chinook salmon, SRWR Chinook salmon, CCV steelhead, CCC steelhead and sDPS green sturgeon while conducting 11 surveys in the San Francisco Bay-Delta region. The studies examine the abundance, and temporal and spatial distribution of various life stages of pelagic fishes of management concern, including listed species, and their food (*e.g.*, zooplankton) resources, along with environmental conditions. These IEP studies are intended to monitor/inform the effectiveness of water operations, aquatic habitat restoration, and fish management practices, thereby providing a benefit to listed fish. The 11 studies included are: (1) Adult Striped Bass, a striped bass population study; (2) Fall Midwater Trawl, which monitors the relative abundance of native and introduced fish species; (3) Sturgeon Tagging, a white sturgeon tagging program; (4) Summer Townet, which targets delta smelt and young-of-the-year striped bass; (5) Estuarine and Marine Fish, a San Francisco Bay trawl study; (6) 20mm Survey, a study to monitor juvenile delta smelt distribution and relative abundance; (7) Yolo Bypass, a research effort to understand fish and invertebrate use of the Yolo Bypass seasonal floodplain; (8) Upper Estuary Zooplankton, which targets multiple zooplankters; (9) Spring Kodiak Trawl, which determines the relative abundance and distribution of spawning delta smelt; (10) Suisun Marsh Survey, monitoring to determine the effects of the Suisun Marsh Salinity Control Gates operation on fish, including listed salmonids; and (11) Smelt Larva Survey, which provides distribution data for longfin smelt larvae in the Delta. Listed fish may be captured by fyke net, gill net, midwater trawl, trammel net, hoop net, otter trawl, larval fish net, zooplankton net, Kodiak trawl net, rotary screw trap, and beach seine. The majority of captured fishes will be identified to species, enumerated, measured for standard length,

and released. Juvenile SRWR and CVSR Chinook salmon will be identified using the Delta Model Length-at-Date-of-Capture Table. Listed species will be processed first and released. A subsample of wild juvenile SRWR and CVSR Chinook salmon sized captures will be tissue sampled for genetic analysis, and a subsample of hatchery juvenile SRWR and CVSR Chinook salmon sized captures will be sacrificed (*i.e.*, intentional directed mortality) in order to collect coded wire tag data for management purposes and for stock confirmation. To reduce handling mortality, investigators will conduct water to water transfers, use fish-friendly nets, avoid handling when possible, and will not release fish from a vessel under way.

Permit 13675 – 2R

A notice of receipt of an application for scientific research permit renewal (13675-2R) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 13675-2R was issued to the FFC on December 23, 2015 and expires on December 31, 2020.

Permit 13675-2R authorizes the FFC annually take juvenile-CVSR Chinook salmon, SRWR Chinook salmon, CCV steelhead, and sDPS green sturgeon while conducting research designed to monitor the use of the Fremont Landing Conservation Bank (FLCB) and the Bullock Bend Mitigation Bank (BBMB) at the confluence of the Sacramento and Feather rivers in California's Central Valley. The banks are restored areas that provides mitigation for impacts on listed salmonid species in the Central Valley. The monitoring will evaluate the use of the FLCB and the BBMB by listed fish, provide data directly related to success criteria described in the conservation/mitigation bank management plan, and benefit listed fish by informing adaptive management

strategies being conducted at the FLCB and the BBMB. The researchers will use beach seines and fyke nets to capture listed fish. Once captured, all listed fish will be identified by species and released. A subsample will be measured for fork length. No anesthesia will be used, and no additional handling procedures would take place. Captured fish will remain completely wetted at all times to minimize stress. Any fish exhibiting signs of physiological stress would be immediately released. The researchers are not proposing to kill any of the fish they capture, but some may die as an unintended result of the research.

Permit 13791 – 2R

A notice of receipt of an application for scientific research permit renewal (13791 – 2R) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 13791 – 2R was issued to the USFWS SFWO on December 23, 2015 and expires on December 31, 2020.

Permit 13791-2R authorizes the USFWS SFWO to annually take juvenile and smolt CVSR Chinook salmon, SRWR Chinook salmon, CCV steelhead, and juvenile and larval sDPS green sturgeon while conducting seven research studies. The purpose of the studies is to evaluate/monitor the: (1) abundance, temporal and spatial distribution, and survival of salmonids and other fishes in the lower Sacramento and San Joaquin rivers and the San Francisco Estuary (SFE); (2) occurrence and habitat use of fishes, especially early life history stages, within the Liberty Island and Cache Slough Complex, (3) relative gear efficiencies for all IEP fish survey nets, and also the distribution of delta smelt; (4) littoral habitat use of juvenile Chinook salmon within the Delta; (5) the effect of projected water operations on delta smelt; (6) length at date race criteria of SRWR Chinook salmon sized juvenile Chinook salmon; and (7) SRWR and CVSR Chinook

salmon floodplain usage in the Yolo bypass. These studies will result in capture/handle/release take, tissue sampling, and/or intentional directed mortality. Intentional directed mortality will apply to only juvenile hatchery adipose clipped salmonids and larval green sturgeon. Capture methods will include Kodiak trawl, midwater trawl, beach seine, zooplankton net, larval net, gill net, fyke net, purse seine, and boat electrofishing. All listed fish except adipose fin clipped SRWR and CVSR Chinook salmon will be immediately collected from the sampling gears, placed in containers filled with river water collected at the location being sampled, processed, held in a recovery container filled with aerated river water, and subsequently released at the sampled location. A fin tissue sample will be collected from a subset of natural origin SRWR and CVSR Chinook salmon for stock determination. The purpose of intentional mortality of hatchery origin (adipose clipped) SRWR and CVSR Chinook salmon will be to collect coded wire tags (CWT), and up ten green sturgeon larvae will be killed during larval fish collections in order to identify the contents of the larval trawl net, which can only be achieved in the lab. The data provided by these studies will provide natural resource managers real-time biological and population data on fishes to evaluate the effect of water operations and fish management practices within the SFE, thereby benefiting listed fish.

Permit 14516 – 2R

A notice of receipt of an application for scientific research permit renewal (14516 – 2R) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 14516 – 2R was issued to Dr. Jerry Smith on December 23, 2015 and expires on December 31, 2020.

Permit 14516 – 2R authorizes Dr. Jerry Smith, Associate Professor in the Department of Biological Sciences at San Jose State University to annually take multiple life stages of CCC coho salmon and CCC steelhead while conducting two studies: (1) stream and lagoon surveys in Gazos Creek, Waddell Creek, and Scott Creek; and (2) lagoon surveys in Pescadero Creek Lagoon and San Gregorio Lagoon. The purpose of the studies is to: (1) provide an annual index of relative abundance for juvenile listed salmonids, provide data on lagoon and upstream habitat utilization and growth, and provide an assessment of trends and year to year response to variations in habitat conditions; and (2) determine juvenile listed salmonid abundance and growth, and provide adult life history information in the lagoons. Capture methods will include backpack electrofishing, and beach seine. Captured salmonids will be measured, and a subset of juvenile captures and all adults will have scale samples taken, before being released at the capture location. A subsample of juvenile steelhead will also be marked via caudal fin clip to perform a mark-recapture analysis. Scale and fin tissue samples will be taken from adult fish carcasses. Captured live fish will be held in flow-through live cars, covered with a towel to provide shade and cover to calm fish. Adult fish will be processed and released first. In lagoons, live cars will be kept in deeper water with cooler temperatures and less turbidity to prevent warming above ambient temperatures or a decrease in dissolved oxygen. The researchers are not proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities.

Permit 15215

A notice of receipt of an application for scientific research permit (15215) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 15215 was issued to CDFW on December 23, 2015 and expires on December 31, 2020.

Permit 15215 authorizes the CDFW, Fisheries Branch, Fish Health Laboratory to take endangered SRWR Chinook salmon, CCC coho salmon and SC steelhead for a period of five years. The purpose of the research is to investigate wild fish kills/disease outbreaks that could occur in California that involve federally listed endangered species. The research will benefit the listed species by providing fisheries managers with the necessary information to help alleviate future outbreaks of fish disease through proper management of fishery and water resources. The research will only be conducted in the event of elevated and unexplained endangered species mortality or the presence of clinically diseased animals. Given such a triggering event, endangered fish will be collected in any of the state waters of California in which a disease outbreak/fish die-off occurred. Adult and juvenile endangered fish will be collected by hand or dip-net, as only dead and/or moribund fish, or fish displaying clinical signs of disease, will be collected. Moribund or clinically diseased fish will be euthanized (*i.e.*, intentional directed mortality). Trained CDFW pathologists and veterinarians will assess moribund or diseased fish prior to euthanasia, and only fish that will likely die regardless of the actions proposed by CDFW will be euthanized. Necropsies will be performed on dead and euthanized captured fish either in the laboratory or in the field, fish will be examined for signs of parasitic and bacterial infections, and fin and/or internal tissues will be collected for virology, histopathology, immunological testing and/or DNA testing.

Permit 16274

A notice of receipt of an application for scientific research permit renewal (16274) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 16274 was issued to the MRC on December 23, 2015 and expires on December 31, 2020.

Permit 16274 authorizes the MRC to take CC Chinook salmon, SONCC coho salmon, CCC coho salmon, NC steelhead, and CCC steelhead while conducting research and monitoring to assess juvenile and adult populations of salmonids and their distribution in streams within MRC's property. Research will be conducted in several watersheds within Mendocino and northern Sonoma counties. The data gathered will benefit listed fish by informing a better understanding of salmonid distribution, abundance, and habitat utilization in these areas. Juvenile salmonids will be captured by backpack electrofishing, anesthetized, weighed, measured to fork length, and released. A subsample of juvenile salmonids will be fin clipped to mark and to collect tissue samples for genetic analysis. Live adults and/or juveniles will be observed via snorkel surveys and spawning surveys. Carcasses will be measured and then marked to ensure duplicate measurements were not made. Outmigrant trapping will be conducted using a rotary screw trap or weir/pipe trap; captured outmigrants will be anesthetized, measured, and released. A subsample of outmigrants will be marked (dye, elastomer, or fin clip) or Passive Integrated Transponder (PIT) tagged. All anesthetized fish will be allowed to recover in a bucket containing aerated natal water prior to being released back into the stream from which they were taken. The researchers are not proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities.

Permit 17063

A notice of receipt of an application for scientific research permit renewal (17063) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 17063 was issued to the USFS, Redwood Sciences Laboratory on December 23, 2015 and expires on December 31, 2020.

Permit 170963 authorizes the USFS, Redwood Sciences Laboratory to perform eight studies that together will take CC Chinook salmon, SONCC coho salmon, CCC coho salmon, NC steelhead, CC steelhead, and SC steelhead. The purposes of the eight studies are: (1) to investigate the invasion history of non-listed speckled dace in the Van Duzen River and the Eel River, (2) to investigate the invasion history of non-listed California roach in the Van Duzen River and the Eel River, (3) to develop an Individual Based Modeling (IBM) approach to predict the effects of management practices on salmonid population in Northern California, (4) to link abiotic factors (*e.g.*, distance to spawning ground) to the expression of an anadromous or resident life history for *O. mykiss* in the Eel River, (5) to link the distribution and movement of watershed products (*e.g.*, wood, sediment, and water) in tributaries and mainstem channels to fish diversity and abundance in Northern California rivers, (6) to provide managers with insights into the status and relatedness of Sacramento sucker populations in northern California, (7) to document the speckled dace invasion of the Mad River, and (8) to provide managers with a tool to predict the effects of management decisions on Santa Ana suckers in the Santa Ana River. Listed adult and juvenile salmonids will be observed via snorkel surveys. Listed juvenile salmonids will be captured via backpack and/or boat electrofishing for all eight studies, and also via beach seine and/or fyke net for Study 6 (*i.e.*, Sacramento sucker relatedness and distribution). For most studies, listed salmonids that are captured

will be anesthetized, measured and/or weighed, and released. Captured fishes will be held in multiple live cars to prevent overcrowding and to maintain acceptable water quality conditions. In addition to capturing, handling and releasing fish, Study 4 (*i.e.* factors affecting the expression of an anadromous versus resident life history in *O. mykiss*) will also include intentional directed mortality for otolith microchemical analyses. A maximum of four *O. mykiss* will be sacrificed from each of seventy sample streams distributed throughout the Eel River, which will include both anadromous (listed as threatened) and resident (non-listed) life history forms.

Permit 17077 – 2R

A notice of receipt of an application for scientific research permit renewal (17077 – 2R) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 17077 – 2R was issued to Dr. Peter Moyle on December 23, 2015 and expires on December 31, 2020.

Permit 17077 – 2R authorizes Dr. Peter Moyle, with the University of California at Davis, Department of Wildlife, Fish and Conservation Biology, to take listed species while conducting research designed to develop a better understanding of how physical habitat, flow and other factors interact to maintain assemblages of native and non-native aquatic species in the upper SFE. This study will provide knowledge about food web and habitat support for native fishes, including listed anadromous fish, which are suspected of utilizing such habitats during development. While listed fish are not the target species for this study, the study will benefit listed fish by improving management decisions regarding creating additional habitat, and helping to anticipate the effects of drought and climate change on food and habitat availability. Sampling will be conducted in three

distinct regions of the SFE: (1) the Cache-Lindsey complex, (2) the Sherman Lake complex and (3) Suisun Marsh, and will take juvenile and adult CVSR Chinook salmon, SRWR Chinook Salmon, CCV steelhead, and sDPS green sturgeon. Capture methods will be similar for each of these regions, and will include otter trawling, beach seining and boat electrofishing, however electrofishing will be suspended immediately upon encountering a listed species. All sampled fish will be placed in a bucket with ambient water and an aerator, examined for responsiveness and returned to the water as soon as possible with a minimum of handling, after identification and length estimates were made. Juvenile SRWR and CVSR Chinook salmon will be identified using published size-at-date criteria. Only adult green sturgeon captures will receive additional processing beyond identification and measuring for length. Adult green sturgeon will be scanned for the presence of a PIT tag, and a soft pelvic fin tissue sample will be collected. The researchers are not proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities.

Permit 17219

A notice of receipt of an application for scientific research permit renewal (17219) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 17219 was issued to the NMFS SWFSC, Fisheries Ecology Division on December 23, 2015 and expires on December 31, 2020.

Permit 17219 authorizes the NMFS SWFSC, Fisheries Ecology Division to conduct research throughout California that will include take of SRWR Chinook salmon, CVSR Chinook salmon, SONCC coho salmon, CCC coho salmon, NC steelhead, CCC steelhead, CCV steelhead, S-CCC steelhead, SC steelhead, and juvenile sDPS green

sturgeon. The research will benefit listed fish by supporting conservation and management of listed anadromous salmonids and green sturgeon in California by directly addressing information needs identified by NMFS and other agencies. FED studies address priority topics identified in NMFS technical recovery team reports, NMFS recovery plans, joint programs such as the California Coastal Monitoring Program developed by NMFS and CDFW, and state programs such as the Fisheries Restoration Grant Program. Research objectives of specific studies include: (1) estimating population abundance and dynamics; (2) evaluating factors affecting growth, survival, and life-history; (3) assessing life-stage specific habitat use and movement; (4) collecting data necessary to construct various types of models (*e.g.*, population, life-cycle, bioenergetics, and habitat-use models); (5) determining genetic structure of populations; (6) evaluating the effects of activities such as water management and habitat restoration on populations; and (7) developing improved sampling and monitoring methods.

Research and take will involve various life stages (juvenile, smolt, adult, and carcass). Listed fish will be observed during spawning surveys, and captured by electrofishing, beach seine, rotary screw trap, and/or hook-and-line. The majority of captured fish will be anesthetized, measured to fork length, and released. A subsample of captured fish will be further sampled by collection of scales, fin clips, gill clips or stomach contents; and/or marking or tagging including fin tissue clips, PIT tags, elastomer tags, acoustic tags, or radio tags. Species care after capture will include use of aerated buckets or live cars for holding and recovery, and minimization of handling time. The majority of fish captured will be released alive at their point of capture following recovery from handling. However, in limited cases some fish will be: (1) retained in

enclosures in streams for short-term growth and survival experiments and then released, or (2) euthanized for analysis of otoliths and/or parasitological/pathological studies of parasites and diseases of wild juvenile steelhead.

Permit 17272

A notice of receipt of an application for scientific research permit renewal (17272) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 17272 was issued to the USFWS AFWO on December 23, 2015 and expires on December 31, 2020.

Permit 17272 authorizes the USFWS AFWO to take multiple life stages of hatchery and wild SONCC coho salmon via monitoring and research activities in Northwest California. The purposes of the five studies included are to monitor: (1) Chinook salmon fry production and disease incidence in the Klamath River below Iron Gate dam, (2) Chinook salmon escapement in the mainstem Klamath River below the Shasta River confluence, (3) Chinook salmon escapement in the mainstem Klamath River from Iron Gate dam to the Shasta River confluence, (4) coho salmon escapement between Iron Gate Dam and the Indian Creek confluence, and (5) long-term salmonid disease incidence in the lower Klamath River. Trained AFWO crews will conduct redd surveys, on foot and from rafts, which could observe/harass spawning SONCC coho salmon. Crews will spend minimal time around redds and avoid walking on redds. Trained AFWO crews will also capture juvenile SONCC coho salmon using rotary-screw traps, frame nets, and beach seines. Juvenile coho salmon will be held in aerated holding buckets filled with fresh river water then anesthetized, measured for fork length, weighed, and released back into the river. There will be some intentional mortality of

hatchery juvenile coho salmon for disease analysis. Aside from these hatchery fish, the researchers are not proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities. The studies will benefit listed coho salmon by informing the AFWO goal to develop conservation strategies for aquatic resources and to evaluate the success of aquatic habitat restoration efforts that will lead to the recovery and conservation of fish populations and fisheries in northern California.

Permit 17351

A notice of receipt of an application for scientific research permit renewal (17351) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 17351 was issued to the GDRC on December 23, 2015 and expires on December 31, 2020.

Permit 17351 authorizes the GDRC to take listed salmonids while conducting research and monitoring under an existing Aquatic Habitat Conservation Plan (AHCP). The AHCP, which was approved in 2007 and is valid until 2057, identifies potential threats to three listed fish species that may result from GDRC's timber harvest activities and describes minimization and mitigation measures and effectiveness monitoring to address potential threats. The requested take limits will allow for implementation of monitoring and research activities in several northern California watersheds including the Winchuk River, Smith River, Lower Klamath basin tributaries, Mad River, Little River, several Humboldt Bay tributaries, and Eel River. The three species identified which will be taken as a direct result of this monitoring are CC Chinook salmon, SONCC coho salmon, and NC steelhead. Research and take will involve various life stages (fry, juvenile, smolt, adult, and carcass). Trained GDRC crews will observe listed salmonids

during snorkel surveys and spawning surveys. Crews will avoid walking in suitable spawning habitats (*e.g.*, riffle crests). Listed salmonids will be captured by various capture methods including backpack electrofishing, kick net sampling, rotary screw trapping, v-notch weir outmigrant trapping, and minnow trapping. Most captured fish will be measured and released. A subsample of captured fish will be anesthetized, then marked via dorsal fin clip, fin tissue sampled, scale sampled, and/or PIT tagged. Anesthetized individuals will be allowed to recover in mesh containers placed in the stream channel prior to release. Data collected will be used to document long-term population trends and better understand the potential impacts on the covered species and their habitats that may result from AHCP covered activities. The researchers are not proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities.

Permit 17396

A notice of receipt of an application for scientific research permit (17396) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 17396 was issued to the USFWS AFRP on December 23, 2015 and expires on December 31, 2020.

Permit 17396 authorizes the USFWS AFRP to take listed fish while conducting research designed to: (1) provide data necessary to evaluate the effectiveness of AFRP restoration projects, including appraisal of spawning gravel augmentation, in-channel and floodplain habitat enhancement actions, and water allocation/flow regime alteration actions; and (2) provide reconnaissance-level population and biological data on contemporary anadromous fish population patterns within the Central Valley of California, in order to prioritize and select future restoration projects to benefit

anadromous salmonids. All AFRP restoration monitoring projects will serve to benefit anadromous salmonids by providing data on restoration project effectiveness, and providing valuable information relating to adaptive management procedures. Take of listed species including various life stages of CVSR Chinook salmon, CCV steelhead, and sDPS green sturgeon will result from activities in the following five projects: (1) Bobcat flat restoration effectiveness monitoring in the lower Tuolumne River; (2) adult sturgeon acoustic telemetry in the lower San Joaquin basin; (3) San Joaquin River sturgeon spawning habitat assessment; (4) steelhead sampling and acoustic tracking in the lower Stanislaus, Tuolumne and Merced Rivers; and (5) fish reconnaissance in the San Joaquin River system. Observe/harass take will result from snorkel surveys. Capture methods will include beach seine, trammel nets, gill nets, fyke nets, hook-and-line, egg mats, benthic d-nets, and boat and backpack electrofishing. The majority of captured listed fish will be handled and released; a subsample of captures will be anesthetized, scale sampled, fin clipped (to mark and to collect fin tissue for genetic analysis), acoustic tagged, and/or subject to intentional directed mortality. Green sturgeon eggs ($n = 100$) and larvae ($n = 5$) will be intentionally sacrificed, which will be necessary to provide voucher tissue specimens, and will benefit the species by providing critical information on green sturgeon spawning habitat. To minimize physiological stress, all sturgeon will be held in a net pen submerged in river or with flowing water through their gills while waiting to be handled. All listed salmonids will be immediately collected from the sampling gears, placed in five gallon buckets filled with fresh river water from the location being sampled, processed, held in another container filled with fresh river water for recovery, and subsequently released in the sampled location. The

new information on these species generated by these projects will help prioritize future restoration projects, thus benefiting listed species.

Permit 17867

A notice of receipt of an application for scientific research permit renewal (17867) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 17867 was issued to the HRC on December 23, 2015 and expires on December 31, 2020.

Permit 17867 authorizes the HRC to take juvenile and adult CC Chinook salmon, SONCC coho salmon and NC steelhead while conducting research and monitoring that satisfies two objectives: (1) to comply with CDFW's Restorable Class I policy by sampling reaches through snorkel and electrofishing methods to identify Class I habitat within proposed timber harvest plans, and (2) to monitor fish occupancy trends at the reach, sub basin, watershed and HRC property level over time by repeated snorkel surveys at index and randomly selected reaches. Adult and juvenile salmonids will be observed during snorkel surveys, and juvenile salmonids will be captured by backpack electrofishing. Snorkel surveys will be the preferred method of detecting presence/absence of fish species. Captured fish will be identified, and transported upstream of the project area. All captured specimens will be kept in aerated buckets, observed closely, and not released until fully recovered. The monitoring will help to achieve HRC's fisheries program's general goal, which is to determine the occurrence, distribution, population and habitat conditions of anadromous fishes on HRC lands as well as to monitor, protect, restore and enhance the anadromous fishery resources in watersheds owned by HRC. The researchers are not proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities.

Permit 17877

A notice of receipt of an application for scientific research permit renewal (17877) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 17877 was issued to the BOR on December 23, 2015 and expires on December 31, 2020.

Permit 17877 authorizes the BOR to take juvenile, smolt, adult and carcasses of SONCC coho salmon via: (1) observation/harassment by way of snorkel surveys, hand netting that specifically targets other species, and spawning surveys; and (2) capture by rotary screw trap, boat electrofishing, hook-and-line, beach seine, fyke net, or minnow trapping. The BOR applied for this permit as a contingent of the Trinity River Restoration Program (TRRP), an inter-agency partnership of the BOR, USFWS, Hoopa Valley Tribe, Yurok Tribe, CDFW, Trinity County, USFS, NMFS, and the California Department of Water Resources. The TRRP benefits listed species by conducting large-scale channel restoration and habitat restoration activities in the Trinity River mainstem and watershed as a means of restoring declining fishery resources. The following six specific studies are included: (1) Trinity River juvenile salmonid outmigrant monitoring, (2) juvenile Chinook salmon density monitoring, (3) Trinity River Chinook salmon redd and carcass survey, (4) Trinity River invasive brown trout predation on coho investigation, (5) Trinity River juvenile coho salmon ecology study, and (6) watershed rehabilitation/research. Fin tissue samples will be collected from carcasses. The majority of captured juvenile coho salmon will be anesthetized, measured to fork length and released, but a subsample will also be PIT tagged. Tagged fish will be held in recovery pens post tagging to monitor and enhance post-tagging health. The researchers are not

proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities.

Permit 17916

A notice of receipt of an application for scientific research permit renewal (17916) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 17916 was issued to the BLM on December 23, 2015 and expires on December 31, 2020.

Permit 17916 authorizes the BLM to monitor the effects of current management actions related to the Northwest Forest Plan's Aquatic Conservation Strategy on anadromous salmonids and their habitats. In order to monitor land management actions and implement the Northwest Forest Plan in northern California, BLM needs to obtain updated information on fish distribution and habitat. Sampling will occur in various watersheds, including the Mattole River, Eel River, Lost Coast region tributaries to the Pacific Ocean, and Humboldt Bay tributaries. Take of CC Chinook salmon, SONCC coho salmon, and NC steelhead will result from this monitoring and research. The preponderance of requested take will result from spawning surveys, snorkel surveys, and presence/absence surveys from the bank, all of which will result in observe/harass take of juvenile and/or adult salmonids. Capture methods that will take juvenile salmonids include backpack electrofishing and beach seine. A small number of salmonid fry may also be captured during kick net activities intended to sample invertebrates. Electrofishing will be used only when stream conditions prohibit less invasive sampling methods. Personnel handling fish will have wet hands and experience in fish handling. After length measurements were complete, fish will be placed in a bucket of freshwater for longer than 30 minutes to allow for recovery prior to being released. Recovering fish

will be kept in cool, shaded, aerated water and will not be overcrowded. This research will benefit listed fish by informing adaptive management strategies intended to aid in the recovery of at-risk anadromous salmonids. The researchers are not proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities.

Permit 18012

A notice of receipt of an application for scientific research permit renewal (18012) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 18012 was issued to the CDFW, Bay Delta Region (Region III) on December 23, 2015 and expires on December 31, 2020.

Permit 18012 authorizes the CDFW, Bay Delta Region take listed species while conducting two research projects, the Watershed Restoration Project (WRP) and the Fisheries Management Project (FMP), designed to assess and restore the productivity of CC Chinook salmon, CCC coho salmon, NC steelhead, CCC steelhead, and S-CCC steelhead in Sonoma, Mendocino, Napa, Marin, San Mateo, Santa Cruz and Monterey counties in north central California. Program staff will accomplish this goal by conducting habitat and salmonid surveys to determine potential limiting factors and stock status in order to identify the specific measures and actions needed to protect and increase production of listed salmonids. The authorized studies include: (1) juvenile salmonid occurrence, distribution and habitat monitoring; (2) adult salmonid occurrence, passage, and distribution; (3) spawning ground surveys; (4) life cycle station monitoring; and (5) juvenile steelhead lagoon beach seining. Listed fish will be observed/harassed during snorkel surveys, spawning surveys, carcass surveys, and by the use of electronic counting

stations (*i.e.*, DIDSON camera, Vaki Riverwatcher and/or video weir). Listed salmonids will be captured using backpack electrofishing, beach seining, rotary screw traps, fyke/pipe traps, and potentially adults may be captured using a resistance board weir. The majority of juvenile captures will be handled (measured for fork length and weighed), and released. A subset of juvenile salmonid captures will be anesthetized, fin tissue sampled to collect tissue for genetic analysis, scale sampled, marked with an upper caudal fin clip, and/or PIT tagged. Only healthy fish with no signs of stress or injury will be subjected to marking or tagging. All fish will be allowed to recover fully and will be observed carefully for injury prior to release. Captured adult salmonids will be handled (*i.e.*, identified, measured, weighed, and scale and tissue samples taken), tagged (bi-colored Floy tags and/or opercular-hole-punched) and released upstream of the weir. All fish handled will be held in clean and decontaminated containers that are supplied with cool, aerated water and will be released back into the stream reach from which they were collected after recovery. Implementation of these activities under the WRP and the FMP will benefit listed species by informing recommendations on proposed habitat restoration projects and by determining the impacts of various management actions. The researchers are not proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities.

Permit 18712

A notice of receipt of an application for scientific research permit (18712) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 18712 was issued to H.T. Harvey & Associates on December 23, 2015 and expires on December 31, 2020.

Permit 18712 authorizes H.T. Harvey & Associates to take juvenile and smolt CC Chinook salmon, SONCC coho salmon, CCC coho salmon, NC steelhead, and adult sDPS eulachon while completing a project that is intended to meet three Marine Protected Area (MPA) monitoring goals set by the MPA Monitoring Enterprise. The three monitoring goals are: (1) to assess trends in the condition of ecosystems inside and outside of MPA's, (2) to evaluate the effects of specific MPA design criteria such as MPA size and distance between MPAs, and (3) to evaluate the effect of visitors on MPAs. The project will contribute to the goals of the monitoring enterprise by describing the baseline biological community in four northern California estuaries: (1) Mad River Estuary in Humboldt County, (2) South Humboldt Bay State Marine Recreational Management Area in Humboldt County, (3) Ten Mile Estuary State Marine Conservation Area (SMCA) in Mendocino County, and (4) Big River Estuary SMCA in Mendocino County. Beach seines and fyke nets will be used to capture fish whereby take (*i.e.*, capture/handle/release) of listed salmonids will occur. Handling will consist of identifying and measuring fish to fork length. To ensure that handled fish will experience minimal adverse effects as a result of the sampling process, fish will be allowed to recover briefly either in live wells or in shaded, aerated buckets. The researchers are not proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities.

Permit 18937

A notice of receipt of an application for scientific research permit (18937) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 18937 was

issued to the Scripps Institution of Oceanography, University of California, San Diego, CSGCP on December 23, 2015 and expires on December 31, 2020.

Permit 18937 authorizes the Scripps Institution of Oceanography, University of California, San Diego, CSGCP to annually take listed CC Chinook salmon, CCC coho salmon, and CCC steelhead while monitoring the status and trends of listed salmonids in the Russian River watershed. The CSGCP will collect data to estimate population metrics such as abundance, survival, growth, and spatial distribution of multiple life stages of salmonids, and relate them to different recovery actions including hatchery releases, habitat enhancement projects, and stream flow improvement projects. Data collection will be designed to meet four specific study objectives: (1) evaluation of the Russian River Coho Salmon Captive Broodstock Program, (2) implementation of the California Coastal Salmonid Monitoring Plan, (3) comparing juvenile coho salmon oversummer survival with stream flow, and (4) evaluation of habitat enhancement projects. The four studies will provide resource agencies with valuable information that will help guide future decisions regarding recovery actions. Fish populations will be monitored in many tributaries of the Russian River watershed and several methods that could observe/harass and/or capture fish will be employed, including: snorkel surveys, spawning surveys, redd surveys, downstream migrant trapping (pipe/funnel trap), minnow trapping, operation of PIT tag detection systems (*i.e.*, PIT tag arrays and PIT tag wand surveys), and backpack electrofishing. Handling of live fish captured in traps or during electrofishing surveys will include anesthetization, measuring for fork length, scanning for CWT and PIT tags, fin tissue sampling, scale sampling, PIT tagging, and/or gastric lavage. Adult salmonid carcasses encountered during spawning surveys will be

scanned for PIT tags, measured, fin clipped, scale sampled, and otoliths will be extracted. All live fish will be released back into the stream following recovery in aerated buckets of cold water. Specific measures that will be taken to reduce the risk of injury or mortality to fish include minimizing the time that fish are handled, placing potential predators in separate holding buckets, running aerators in buckets, avoiding overcrowding in buckets, changing water in the anesthesia bucket frequently, placing a thermometer in holding buckets and replacing water frequently if the temperatures are rising, wetting measuring boards and weigh pans, processing listed species first, checking traps at least once per day and more frequently in high flow or windy conditions, and placing flow deflectors inside the trap box to provide refugia for fish. The researchers are not proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities.

Permit 19121

A notice of receipt of an application for scientific research permit (19121) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 19121 was issued to the USGS, California Water Survey on December 23, 2015 and expires on December 31, 2020.

Permit 19121 authorizes the USGS, California Water Survey take of listed species associated with completing two main objectives: (1) to examine research applications of the SmeltCam that have been developed and coordinated with the IEP, and (2) to provide fisheries science support for the BOR's compliance with Biological Opinions. The studies are intended to: (1) provide new quantitative data addressing the potential benefits of habitat restoration to the SFE and Delta ecosystem and its native fish populations, and

(2) determine the vertical and lateral distribution of delta smelt, and the continued evaluation and application of SmeltCam technology for studies of delta smelt and other fishes. The results of these studies are expected to provide net benefits to listed species by improving our understanding of their ecology and habitat use, and by informing the development of new research tools that can guide management decisions and habitat restoration actions. Sampling will be conducted in Suisun Bay, and will take multiple life stages of CVSR Chinook salmon, SRWR Chinook salmon, CCV steelhead, and sDPS green sturgeon. Capture methods will include beach seine, fyke trap, larval net, otter trawl, midwater trawl, boat electrofishing, set line, and gill net. All sampling will follow methods and protocols designed to minimize take of listed species while conducting research and monitoring. For example, sampling gear such as gill nets will be watched closely to monitor the status of any fishes entangled in the net. Set times will be short (approximately one hour), and nets will be set in habitats that listed fish are unlikely to inhabit. Listed salmonids captured in the course of sampling will be identified, carefully measured for length and released. Green sturgeon will be anesthetized using MS-222, scanned for a presence of a PIT tag, PIT tagged if no PIT tag is present, tissue sampled, and allowed to recover prior to release. All fishes collected in any sampling gear will be handled as gently as possible to facilitate safe release back to the water. The researchers are not proposing to kill any of the fish they capture, but a small number may die as an unintended result of the activities.

Permit 19320

A notice of receipt of an application for scientific research permit (19320) was published in the *Federal Register* on April 8, 2015 (80 FR 18820). Permit 19320 was

issued to the NMFS SWFSC, Fisheries Ecology Division on December 1, 2015 and expires on October 29, 2020.

Permit 19320 authorizes the NMFS SWFSC, Fisheries Ecology Division to annually take sub-adult and juvenile listed salmon and steelhead for a period of five years. The permit will authorize research designed to (1) determine the inter-annual and seasonal variability in growth, feeding, and energy status among juvenile salmonids in the coastal ocean off northern and central California; (2) determine migration paths and spatial distribution among genetically distinct salmonid stocks during their early ocean residence; (3) characterize the biological and physical oceanographic features associated with juvenile salmon ocean habitat from the shore to the continental shelf break; (4) identify potential links between coastal geography, oceanographic features, and salmon distribution patterns; and (5) identify and test ecological indices for salmon survival. This research will benefit listed fish by informing comprehensive lifecycle models that incorporate both freshwater and marine conditions and recognize the relationship between the two habitats; it will also identify and predict sources of salmon mortality at sea and thereby help managers develop indices of salmonid survival in the marine environment.

Listed fish will be captured primarily via surface trawling, however midwater trawling and beach seining will be used occasionally. Sub-adult salmonids (i.e., fish larger than 250 mm) that survive capture will have fin tissue and scale samples taken, and then be released. Any subadult salmonids that do not survive capture, and all juvenile salmonids (i.e., fish larger than 80 mm but less than 250 mm) will be lethally sampled (i.e., intentional directed mortality) in order to collect (1) otoliths for age and growth

studies; (2) coded wire tags for origin and age of hatchery fish; (3) muscle tissue for stable isotopes and/or lipid assays; (4) stomachs and contents for diet studies; and (5) other tissues including the heart, liver, intestines, pyloric caeca, and kidney for special studies upon request.

Permit 19400

A notice of receipt of an application for scientific research permit (19400) was published in the *Federal Register* on July 29, 2015 (80 FR 45197). Permit 19400 was issued to ICF consulting on December 23, 2015 and expires on December 31, 2020.

Permit 19400 authorizes ICF consulting to take juvenile CVSR Chinook salmon and SRWR Chinook salmon while conducting a study to investigate if longfin smelt in San Pablo Bay shift their vertical distribution under different environmental and biological conditions. Although this study principally targets longfin smelt, ESA listed Chinook salmon will be encountered during sampling. ICF will collect data that will be useful to local researchers on captured and/or photographed listed Chinook salmon, including abundance, length, and potentially tissue samples. Fish will be sampled using a midwater trawl, however the majority of tows will be conducted with only a video device (*i.e.*, SmeltCam) acting as the codend. Therefore, the majority of take will be observe/harass. The fish camera image program will be able to determine the length, and thereby an estimate of the race/run/listing status, of salmon that pass through the net. In order to verify the results of the SmeltCam, some tows will be conducted with both the video device and a traditional codend. Physically captured juvenile salmonids will be placed in a bucket with aerated water, handled (*i.e.*, measured to fork length and possibly

fin tissue sampled for genetic analysis), and released. The researchers are not proposing to kill any of the fish they capture.

Dated: January 12, 2016.

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